

CLAIMS

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is as follows:

1. A method of executing a matrix subroutine, said method comprising:

storing data for a matrix subroutine call in a computer memory in an increment block size that is based on a cache size.

2. The method of claim 1, further comprising:

retrieving said data from said memory in units of said increment block;

and

executing at least one matrix subroutine using said data.

3. The method of claim 1, wherein said data is stored contiguously.

4. The method of claim 1, wherein said cache comprises a cache having a size NB and said block increment size comprises a block of size $2NB$ by $NB/2$.

5. The method of claim 1, wherein said cache comprises an L1 cache, said L1 cache representing a cache closest to at least one of a Central Processing Unit

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(CPU) and a Floating-point Processing Unit (FPU) of a computer system associated with said computer memory.

6. The method of claim 1, wherein said matrix data is loaded contiguously in said memory in increments of a memory line size LS and data is retrievable from said memory in units of LS.

7. The method of claim 2, wherein said at least one matrix subroutine comprises a matrix multiplication operation.

8. The method of claim 2, wherein said at least one matrix subroutine comprises a subroutine from a LAPACK (Linear Algebra PACKage).

9. The method of claim 2, wherein an entire block is executed by said subroutine as a result of a call for data.

10. An apparatus, comprising:

a processor for processing a matrix subroutine;

a cache associated with said processor; and

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a memory, wherein said memory loads a data for memory calls of said matrix subroutine in an increment block size that is based on a dimension of said cache.

11. The apparatus of claim 10, wherein said cache comprises a cache having a size NB, and said block increment size comprises a block of size $2NB$ by $NB/2$.
12. The apparatus of claim 10, wherein said matrix subroutine comprises a matrix multiplication operation.
13. The apparatus of claim 10, wherein said matrix subroutine comprises a subroutine from a LAPACK (Linear Algebra PACKage).
14. The apparatus of claim 10, wherein a line size of said memory is LS and data is retrieved from said memory in units of LS.
15. A signal-bearing medium tangibly embodying a program of machine-readable instructions executable by a digital processing apparatus, said instructions including a method of storing data for a matrix subroutine call in a computer memory in an increment block size that is based on a cache size.

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16. The signal-bearing medium of claim 15, wherein said matrix subroutine comprises a subroutine from a LAPACK (Linear Algebra PACKage).

17. The signal-bearing medium of claim 15, wherein said cache comprises a cache having a size NB, and said block increment size comprises a block of size $2NB$ by $NB/2$.

18. The signal-bearing medium of claim 15, wherein a line size of said memory is LS and data is retrieved from said memory in units of LS.

19. A method of solving a problem using linear algebra, said method comprising at least one of:

initiating a computerized method of performing one or more matrix subroutines, wherein said computerized method comprises storing data for a matrix subroutine call in a computer memory in an increment block size that is based on a cache size;

transmitting a report from said computerized method via at least one of an internet interconnection and a hard copy; and

receiving a report from said computerized method.

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20. The method of claim 19, wherein said cache comprises a cache having a size NB , and said block increment size comprises a block of size $2NB$ by $NB/2$.

21. A method of providing a service, said method comprising an execution of a matrix subroutine in accordance with the method of claim 1.

22. A method of providing a service, said method comprising at least one of:
solving of a problem using linear algebra in accordance with the method of claim 19; and
providing a consultation to solve a problem that utilizes said computerized method.